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ABSTRACT

At the University of Rhode Island, the goal of the Library is to meet the informational needs of a diverse clientele: students, both graduate and undergraduate; faculty; other university staff; and, as a land-grant institution serving the state of Rhode Island, the general public. This report results from 8 months of committee work that involved writing and reading drafts, reading departmental reports, conducting interviews, making presentations, and attending weekly meetings. The first three sections comprise the bulk of the report. Section One addresses issues related to the environment: technological, professional, and societal trends as well as descriptions of the state and local environment in which the library operates. An in-depth examination of the current uses of the computer in the library, Section Two reviews three areas: the use of OCLC (Online Computer Library Center) for cataloging, CLSI (CL Systems Inc.) for circulation, and the use of the computer for production of the library's serials list. The third section is an assessment of the critical needs of the library, which examines four processes or activities: a patron's search for a book, a patron's search for a serial, library processing of a new book request, and library processing of a new serial request. Recommendations based in part on the analysis of these processes, are presented in Section Four. The final section is an appendix including a bibliography and a glossary. (THC)

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Report of the

Committee on Computer Applications in the Library

September, 1985

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Introduction

The following report is in five sections. The first three sections comprise the bulk of the report. Section one addresses issues related to the environment. These include technological, professional and societal trends as well as descriptions of the state and local environment in which the University Library exists. Section two, Library Automation at URI, is an in-depth examination of the current uses of the computer at the Library. Three areas are reviewed: the use of OCLC for cataloging, CLSI for circulation and the use of the computer for production of the Library's serials list. The third section, Library Needs Analysis, is an assessment of the critical needs of the Library. To achieve this, four processes or activities are examined. These are: a patron's search for a book, a patron's search for a serial, library processing of a new book request and library processing of a new serial request. It is primarily from the analysis of these processes that the recommendations of section four are based. The final section is a collection of supporting material including appendices, a bibliography and a glossary.

Recognitions

This report is the result of much work by a small group of people. Over the course of eight months they wrote drafts, read drafts, read dusty departmental reports, conducted interviews, made presentations, and, last but not last, were faithful in attendance at weekly Committee meetings. Each of them made important contributions to the report.

Another small group must also be recognized, the team of two consultants that worked with the Committee. The consultants, Jeff Gardner and Paul Peters, are associated with the Office of Management Studies of the Association of Research Libraries. They were invaluable in getting the Committee going, keeping it going, critiquing the results and providing direction and guidance without dictating a pre-defined course of their own. However, it should also be emphasized that this report is not the consultants report; the writing, analysis and other related work was done entirely by the Committee.

Finally, the role of the Dean of the Library must be acknowledged. Dean Arthur Young has been supportive of the Committee's efforts from the beginning. He provided the financial resources necessary to work with the consultants and he has consistently shown his support of the Committee's efforts by a willingness to discuss any issue relative to the Committee's work. His cooperation and support is an important factor in this report.

1. The Environment

An academic library provides service to its users through the acquisition and preservation of resources. A major responsibility is not simply to store the world's accumulated knowledge, but rather to make information accessible to those the library serves. At the University of Rhode Island the goal of the Library is to meet the informational needs of a diverse clientele: students, both graduate and undergraduate; faculty; other University staff; and, as a land-grant institution serving the state of Rhode Island, the general public.

1.1. The Library's Clientele

As the nation enters the information age, sometimes referred to as an age of information overload, the mission of the library is becoming more complex and important. The production of ever increasing amounts of information has been accompanied by the development of new techniques in the storage and retrieval of information. The application of computer hardware and software to information systems, both within and outside the library, has placed new demands on the library in meeting its goal of service to users. It is the responsibility of the URI Library to meet these growing needs through the innovative use of technology, which contemporary library users will quickly come to expect.

Given a changing environment, it is essential that the library understand its clientele. What are the expectations of the academic library user in this new environment? What demands

is the user placing on the library for service in an increasingly automated environment?

Studies have shown that many library users are becoming more sophisticated in the use of non-traditional library materials. In addition to traditional resources, such as printed books and journals, and traditional tools, such as card catalogs and indexes, library users are becoming accustomed to reading micromaterials or CRT's and acquiring information online through computer systems. Increasingly, scholars and researchers in the academic library are oriented more toward information itself and access to it, rather than to the media in which the information is contained.

In an electronic environment users expect to be able to obtain information quickly, regardless of location. Particularly in a compact geographical area like Rhode Island, researchers expect prompt delivery of materials. Since libraries cannot possibly acquire all materials published, cooperative agreements among libraries and new technologies help to respond to this expectation of researchers.

Commercial organizations have developed large informational and bibliographic databases which are accessible online. The capacity to search these databases allows libraries to retrieve subject bibliographies for scholars and identify resources in minutes that might otherwise take days, even weeks, of manual research by the scholar. Individual researchers with a microcomputer and modem can access such database services directly, bypassing the library entirely. But the proliferation of databases, the variety of searching techniques, and the high cost of

user fees make the library an important intermediary between researchers and commercial databases. The majority of researchers expect to consult an information professional in the library in regard to their online information needs just as they do when conducting complex research in a more traditional method.

With computerized linkage to information, library users also expect to access their own library's collection in one step and from remote locations. Instead of physically coming to the library building, looking up information in the card catalog or serials list, and checking the shelves or circulation desk for the location of an item, many researchers want to obtain this information electronically via an online catalog. With all campus buildings linked through a computer communications network as recommended by the University Task Force on Computer Planning, remote access to the resources of the Library could be available from an office, a dormitory, and other campus locations.

User studies in libraries where online catalogs now exist indicate that library patrons like this new kind of catalog very much. Indeed, patrons often want more than the library's card catalog available online. It is evident that as library users become more aware of the possibilities of computerized information retrieval, their expectations increase accordingly. However, searching by computer can be a complex task and although efforts are being made to make online public access catalogs more user-friendly, catalog users often require assistance from librarians to use the new technology effectively and efficiently.

Changes in user expectations of academic libraries have been accompanied to some extent by changes in the characteristics of the users themselves. Researchers in business, the sciences, and the professions, for example, tend to be more concerned with quick access to information than researchers in the liberal arts. This is significant since enrollment trends nationally indicate more growth in the professional curricula than in the liberal arts.

Other national trends indicate both increasing numbers of part-time students (as older students return to the classroom) as well as the use of more part-time faculty. Part-time students and faculty tend to have less time to visit the library to perform traditional library research. Remote access to library collections during non-standard hours is especially useful. The University's efforts to develop working relationships with business and industry in the state also suggest another group of users whose information demands can best be met by remote access to the Library's collection.

1.2. The Profession

It is clear that developments in technology and changes in the expectation of society have many implications for libraries. Nonetheless, the exact nature of these implications and their effect are the subject of much debate within the profession.

The general perception of the effect of automation on libraries is that machines will do the repetitive, routine tasks and that more services can be provided with less staff. For librarians, this should result in increased professionalism and

productivity. Data collected by the library at the University of California, San Diego, determined that full scale automation of basic library operations would eliminate the handling of over three million pieces of paper per year and release a significant number of staff for other purposes.

However, as academic libraries have incorporated more electronic systems, staff positions have been both eliminated and created. With a few exceptions, there are more jobs that require greater skill, experience and training and fewer that are repetitive and routine. Less repetitive jobs and savings in paper work do not usually translate into personnel savings, however. One major reason is that as automation enhances the researcher's ability to identify and access material, the demand for material grows proportionally. A primary example is the now common information retrieval services offered by URI and most other academic libraries. The ability of the computer to search huge bibliographic databases allows researchers to identify citations that otherwise would have remained hidden in obscure subject headings or buried in a another discipline's research. For the library, online services require additional training, organization, money, and, most costly of all, time: time to interact with patrons, time to search online, time to learn commands and protocols, time to teach others, time to organize a search strategy and time to administer the service as a whole.

The direct effects of online searching on the library are indeed substantial, but one of the most dramatic effects of this new service is indirect: the increased demand for interlibrary loan services. This is a clear example of a way in which automa-

tion does not simply identify material but creates a demand for that material that the library must then meet.

Online search services demonstrate other forces of change at work in the profession. These information retrieval services require the librarian to provide expertise and advice on machine approach, clarification of poorly defined questions, and interpretation of results. These skills draw on both an intimate familiarity with the technical process and an equally intimate understanding of the research process. Academic librarianship will require more rigorous professional training, more specialization, further graduate education to supplement the professional degree and greater emphasis on research.

Professional librarians will be called on to facilitate access to all kinds and types of information, not only that held in the library. Helping design local information systems, planning information networks, assisting with the identification of information sources and advising on the use and selection of new technology are a few examples of contributions that can be made by librarians to the broader community of institutions and user groups. New roles as records managers, information specialists, technical or marketing information specialists or others that are not apparent at this time may supplement or even supplant the traditional roles of library professionals in the future.

Librarians already face a more exacting advancement and promotion process with more emphasis on professional contributions and development. Professionals must be able to respond and

anticipate changing conditions as they assume more leadership roles and interact with peers, clients and vendors. The role of support staff will change as well, as they become more intimately involved with the automated environment. More education, more training and more sophisticated skill will be required of staff in the future in order to deal with increasingly complex work functions. Retraining, continuing education and development will be come even more important.

Nonetheless, despite all these anticipated changes it is primarily the tools of the profession that will change and not the essential function of the librarian. A survey of librarians, library administrators and library school faculty predicted that academic librarians of the future would still be doing general reference, guiding users, interpreting the collection, compiling bibliographies and finding aids and would be helping users rather than operating data retrieval machines. Teaching and research will continue to be important roles. Wide ranging skills, including information science technology, research and statistics knowledge and communication and interpersonal relations skills will grow in importance, according to the survey.

As automated systems become more fully integrated into conventional library operations, opportunities for redeployment of staff and for improvement of traditional services are expected. Automation requires more teamwork and greater personal involvement on the part of individuals along with an increased organizational responsiveness and a need for new work arrangements.

Studies of changing organizational patterns of libraries utilizing new technologies have shown a trend toward smaller

decentralized units with a central administrator. For example, a rapid cataloging unit staffed by clericals may be more efficient and productive than the traditional organization of a cataloging department consisting primarily of professional librarians. The reference department may be divided into several subunits; directional and basic assistance questions may be answered by clerical staff at an information desk, freeing reference librarians for in-depth questions, online searching, collection development and other professional responsibilities. A further development may be the unstaffed circulation desk where individuals could check out their own items and security tags would control loss.

Otto (1982) feels that the separation of public and technical services will no longer be appropriate in the future, while Abell (1982) suggests that reorientation of the library from the function pattern -- acquisitions, cataloging, circulation and reference -- to more disciplinary groupings -- arts, humanities, social science and physical and biological sciences -- would allow librarians to work more closely with their faculty colleagues to meet their information needs.

Certainly, as online systems take over record keeping and procedures, units can become more decentralized and geographically separated as they become less dependent on paper files. Branch libraries, subject specialty collections or grouping by form may allow better, more specialized services to researchers.

Concerns of staff that develop during the planning for automation include the possibility that machines will be used to reduce staffing costs. Individuals may be afraid that they will

be transferred to less acceptable duties or will be replaced altogether. The change of duties that may be required may not have been considered when the individuals were hired. An example is the transformation of clerical assistants into keyboard operators. Some professional librarians may be concerned that they will be merely machine tenders and become less professional, while others perceive automation as an opportunity to undertake activities and services that were not possible previously.

Allen (1983) reported that the occurrence of personnel-related problems with the introduction of automation have been the result of the following: too little involvement in planning the changes by those most affected, poorly arranged work stations, work flow that limits individual work scope and opportunities for advancement, and inadequate training for new responsibilities. These issues are important reminders that the success of automation depends critically on the personnel and staff who interact with the system daily and whose jobs will be affected. These are not necessarily negative constraints. Indeed, it has been found that if a new system is properly introduced with the concerns of staff addressed and considered, staff are frequently excited and enthusiastic about the system and its capabilities.

1.3. Suppliers

A critical element of the library's environment is that of its suppliers. As is true of any organization, the library must operate with the resources that its suppliers can make available to it. For libraries, there are three distinct types of suppliers of automation-related services and products: (1) biblio-

graphic utilities, (2) vendors of system software and hardware and (3) vendors of specialized services.

1.3.1. Bibliographic Utilities

In the past 25 years of library automation, bibliographic utilities have made the greatest impact on library operations. The primary service these utilities offer is the capacity for libraries to share bibliographic data for the cataloging of books. Ideally, when one library has cataloged a book according to nationally agreed upon standards, other libraries use the same bibliographic record. From this record, the library can then order and have printed the cards for its catalog.

A successful bibliographic utility must have these capabilities: a large central database where bibliographic records can be stored; computer software that allows libraries to manipulate and search the database; and, finally, the policies, procedures and hardware that make networking on a large scale possible.

On a national level, the first successful bibliographic utility was OCLC (Online Computer Library Center). For many years OCLC was not only the largest and most successful utility, it was the only one. Today it remains the largest and most successful but in the last five or ten years some serious competitors have arisen.

In 1978 RLIN (Research Libraries Information Network) was started. Its membership is composed of large research libraries and it offers advantages of bibliographic control and access that OCLC does not. These differences are particularly important to large research libraries.

A third utility is UTLAS (University of Toronto Library Automation System). What OCLC is to the U.S., UTLAS is to Canada. UTLAS has had little impact in the U.S. to date, nor is it likely to play a major role in the U.S. market in the future.

Finally, a smaller utility exists on a regional basis, WLN (Western Library Network). Libraries with WLN are enthusiastic about the utility but it appears that WLN will remain a regional, West Coast network.

The importance of these competitors should not be over emphasized. The strength and position of OCLC remains very strong. For all libraries except large research libraries or those in the Northwestern section of the country or in Canada, OCLC is the only practical choice in bibliographic utilities.

1.3.2. Library System Vendors.

The bibliographic utilities are well defined and relatively few in number. The situation is much different with library system vendors: they are many in number and offer a large variety of services from the simple and inexpensive to the comprehensive and costly.

One of the most important distinctions between system vendors is their basic approach to supplying systems. Vendors are commonly divided into two basic types, vendors of "turnkey" systems and those that supply software only.

Turnkey vendors supply everything the library needs to automate: hardware, software, support, etc. For the library, this means the decision to automate is a limited and well defined one, the choice of vendor. There are no complex questions regarding

what terminals, what processor, how much storage, where to get maintenance, and how it will fit together. Moreover, turnkey systems are designed to operate with no local computer expertise. When problems arise with hardware or software, the vendor is responsible for resolution.

These advantages mean the library gives up a lot of freedom, however. By permitting a vendor to handle much of its automation decision-making, a library will find that not all vendor decisions are best for that particular library. The turnkey vendor sells its system to all types of libraries and the system is generally not flexible in meeting local needs.

While turnkey vendors make all the difficult technical decisions for the library, the single library decision of vendor choice becomes especially critical. Many vendors are noted for particular strengths and characteristics. Some, for example, are noted for their circulation software, others for their catalog; some have a strong base of public libraries, others are known for meeting the needs of academic libraries. Given the importance of choosing a turnkey vendor it is imperative that the library choose a vendor that is the best possible match for the size of its collection, clientele, procedures and plans for the future.

Turnkey vendors are the most popular type of vendor and enjoy the longest history. However, in the last five or ten years vendors that supply software only have increased in number. There are several reasons for this. One is that libraries have benefited from experience and gained some personnel who are comfortable in making decisions once made for them by turnkey

vendors. If the library is capable of such decisions, the system will be better tailored to the local situation.

Another key difference between turnkey and software-only systems is that the turnkey system is a closed one. Improvements in software or hardware are completely within the purview of the vendor. Indeed, it is typical for the library to be contractually prohibited from making changes. Alternatively, vendors of software-only systems invite, even encourage, local improvements that may then be made available to other libraries with the software.

There is no objective best approach between these two alternatives. For any specific library the best approach depends on many variables, such as size, staff, local expertise, finances, the goals of the library, etc. In choosing a vendor, the library should determine which type of approach is best, turnkey or software only, and seek the vendor that can best meet its goals.

1.3.3. Specialized Vendors

The third type of library vendor is specialized. In many ways the bibliographic utilities are specialized vendors because they typically offer one service (though this single-service characteristic is changing as vendors begin to diversify). But these utilities are so large and play such an important role that they are generally considered separately. Other vendors, however, offer automated systems for smaller, specialized services. An example is that of library acquisitions.

Libraries buy books and serials from a variety of vendors; Baker Taylor and Faxon are two examples. Both these vendors make automated systems available to libraries to perform the

specialized tasks of acquisitions. Generally, these systems, like the bibliographic utilities, access large, remote vendor databases over phone lines.

Specialized vendors have one particular advantage: because they specialize, their systems are generally better suited to the task with more comprehensive and better quality databases. Their biggest disadvantage is that each system is distinct and separate. Each differs in procedures, hardware, data transfer, and other areas. The library that had the Faxon system in serials, Baker Taylor in book acquisitions, OCLC in cataloging, CLSI in circulation, and so on, could find itself in a confused tangle of procedures at every level.

1.4. Technological Trends

The suppliers of library automation determine a large part of the library's automation environment. These suppliers exist in an environment where technology plays a critical role in determining the products they can offer the library.

The technology of automation is marked by constant, substantive improvements over brief spans of time. Moreover, these enhancements of power, speed and reliability are available at lower and lower levels of cost. However, it is not simply rapid improvements at less cost but the magnitude of these changes that makes the technology of automation so exceptional. It is not enough to say that computers have gotten cheaper, when in 25 years they have progressed from major government funded research projects at selected universities to gifts from parents to their children at Christmas. It is not enough to state that computers

have made improvements technologically when these same small Christmas presents exceed their government funded ancestors by almost any measure of performance.

In the midst of this technological utopia, however, there are two important exceptions. The first is software, the instructions to the computer that control its operation. In the early days of computers the costs and importance of hardware, the machine, far outweighed that of software, the instructions. Today, this is reversed. The development is not only the result of decreasing hardware costs relative to software, but that our demands of the computer -- what we want it to do -- have also become much more sophisticated.

Libraries are typical examples of this trend. Integrated systems with near complete bibliographic control have emerged from simple and limited circulation systems. The improvement of the hardware is certainly a factor in this change but the real burden is on a sophisticated software system.

The second exception to the decreasing costs of automation is the increasing costs of communications. To a degree, this is paradoxical because much of the technology that is used in communications is used in automation generally. Indeed, there are many examples of computers serving communications tasks. The primary reason for this paradox is not technological but political and societal: the recent breakup of AT&T. It is unclear how long this trend will continue and how high the price of communication will go. In the immediate future, libraries can expect to pay more for communication. However, in the long run, communication costs are also likely to decline.

There are also some important general trends that can be identified in the library's environment of automation. One is simply the growing number of vendors and options the library can choose. Retrospective conversion is a good example. Ten years ago libraries essentially had a single option in converting their older records to machine readable form. Today there are numerous choices. Some of these options use a microcomputer, others use a remote online database; some allow the library to do a large part of the work of record identification and selection, others will do nearly all the work for the library; some have complete records, others use an abbreviated MARC format. The availability of such options clearly benefits the library, allowing it to choose the best option at the most reasonable cost. But it can also be a bewildering and confusing array of options with constant changes.

Perhaps the most important trend in library automation today has already been briefly mentioned, the integrated system. The integrated system maintains bibliographic control at every stage of processing, from preliminary ordering to cataloging to public access. Moreover, the information about each item is available at every step. For example, a search of the public catalog may indicate the library does not own a book but that it was ordered a few weeks ago; a pre-order search of an item may indicate the library owns the item but that it has been checked out a dozen times in as many months and a second copy may be appropriate.

It should be noted that there is disagreement in the library literature about the characteristics of an integrated system and

whether these exist in any system on the market today. These disagreements aside, however, there is clearly a trend towards the integration of the library's principal bibliographic functions: acquisitions, cataloging, public access catalog, catalog maintenance, serials control, circulation control and serials check-in.

While waiting for the development and refinement of integrated systems libraries are increasingly making use of interfaced systems. Interfacing allow some limited integration of systems that are normally separate and distinct. The URI Library itself is making an application of this concept with OCLC in cataloging and CLSI in circulation. The MARC tapes produced by OCLC are loaded into the CLSI circulation system on a monthly basis.

There are many limitations of interfaced systems. The links between systems are usually crude with little flexibility. Other valuable advantages of an integrated system, such as a common set of procedures, single source of records, etc., are also not gained. Nonetheless, while waiting for the refinement of integrated systems, interfacing allows libraries to utilize specialized systems in areas where integrated systems are not fully developed and still gain some limited benefits of integration.

1.5. The University

The programs of study at URI include a typical undergraduate program aiming at a "balance of studies of the natural and social sciences, the humanities, and professional subjects." (Undergraduate Bulletin, 1984/85) Graduate degree programs include the Masters degree in a variety of areas and the Doctor of Philosophy

degree. Professional degrees include areas such as business administration, library and information studies, community planning, marine affairs and public administration. More background and general information about the University may be found in the Appendix.

1.6. Technology and the University

As the library for the University, the Library is one element of the much larger educational effort to provide quality higher education to the citizens of Rhode Island. In meeting these needs, the University responds to a society that is changing in numerous ways and where technology plays an important role. The Library must be aware of University plans and direction regarding campus automation, particularly the effect these could have on any plans for Library automation.

In 1983 a task force was formed by the Vice President of Academic Affairs "to analyze the current applications and future needs for computing and technological services at URI." (The University of Rhode Island, 1984). The task force developed a strategy for a five year plan to develop the University's computing facilities and submitted its final report in January, 1984.

An important recommendation was the establishment of a University communications network. This network would connect all University buildings and campuses and permit the high speed transmission and reception of voice, data, and video information. Although no specific plans have yet been formalized, the directors of the Academic Computer Center, the Administrative Computer

Center, and the Audiovisual Center believe such a network will be installed in the near future. This network could be a positive resource for the Library.

There are other important recommendations in the report that have implications for the Library. For example, many recommendations call for increasing the University community's access to computer terminals. Along with improved access, the report recommends increased instruction in computer skills. If such recommendations are accepted, the Library can look forward to serving both a faculty and student body with more computer training as well as more access to computer facilities.

An important potential resource of computer expertise for the Library is the services available from the two University computer centers. The Administrative Computer Center handles the University's standard data processing needs and places emphasis on the security of the information it handles. It has no expertise in library applications. The Academic Center handles faculty and student computer research needs in a more flexible environment. Although the Academic Center is interested in library applications, it has had little experience with library automation. Both facilities use IBM or IBM compatible hardware for their mainframes.

The Computer Centers appear more than willing to assist the Library in its future automation needs. Unfortunately both facilities are also critically short on resources and staff with little hope for future improvement. This situation probably precludes their serving as much of a resource in the Library's automation planning.

1.7. The University Library

In addition to the main collection at the Kingston campus, the University Library supports two separate collections, the Claiborne Pell Marine Science Library at the Narragansett Bay Campus and the College of Continuing Education Library (CCE) in Providence. The CCE Library is primarily a "working collection" to provide local resource support for the continuing education courses offered there. The Pell Library contains a specialized research collection. Both libraries serve a focused, limited clientele and the University Library in Kingston is the primary information resource for the University.

The University Library is organized into two departments, Technical Service and Public Services. Within these departments there are seven units, with a total faculty and staff of 74. The Library's collection of 750,000 volumes is augmented by 820,000 microform documents and 300,000 government publications. The Library subscribes to some 7,000 current periodicals. In FY 1983 the Library added 10,000 monographs and circulated 125,000 volumes.

A final important component of the Library is the Audio-visual Center. The AV Center joined the Library administratively in 1981. The Distributive Services section of the Center provides equipment operator services as well as coordination of hardware loans and placements. Production Services includes graphics, photography, audio production, and video production. Additional services include consultation in the design and use of instructional materials, disbursement of public access equipment to the

community in cooperation with Rollins Cablevision, and teaching AV-related courses with the Department of Education and Library and Information Science. These services are an important element of the Library's role as a multi-faceted, multi-media information center.

1.8. The State and Region

As the primary state-supported institution of higher education in the state, URI has important obligations to the state and its citizens. Accordingly, the University Library has obligations to serve as a state resource and to cooperate with other libraries in whatever state-wide efforts may develop. As current examples, the URI Library serves as a state resource for interlibrary loan and the collection is available for use by any state resident.

In Rhode Island there are three important groups responsible for state-wide cooperative efforts between libraries that affect the University Library: the Department of State Library Services (DSLS), the Consortium of Rhode Island Academic and Research Libraries (CRIARL) and the Higher Education Library Information Network (HELIN). The role and activities of each group are briefly outlined below.

1.8.1. DSLS: The Department of State Library Services.

DSLS coordinates interlibrary cooperation within the state with particular focus on public libraries. In preparation for automation, DSLS is dispersing LSCA funds to public libraries for conversion of their bibliographic records to machine-readable form. Providence Public Library, for example, will soon begin a retrospective conversion project.

To facilitate interlibrary loan, DSLS has established an electronic mail system for libraries throughout the state including URI. This Rhode Island Interrelated Library System uses Digital computer equipment for message switching. There are plans to expand the input and output capacity and the storage of the present system to allow for additional uses.

DSLS is also in the process of developing a state-wide library card. A secondary development of the state-wide library card may also be the development of a state-wide telecommunications network. DSLS believes the costs of telecommunications could be reduced for libraries throughout the state if the current automated systems could be linked through one central telecommunications network.

DSLS also provides support to public libraries in sharing an automated circulation system in a consortia arrangement. There are currently two such consortia in the state and both use a CLSI circulation system. The system serves the Barrington and Cranston Public Libraries and is based at DSLS. The other CLSI system is based in the Providence Public Library and includes other public libraries such as Pawtucket and Westerly.

DSLS is currently discussing the possibility of developing transparent data links between the two public library circulation systems with CLSI. This would facilitate state-wide borrowing by linking patron files and the loan status of materials in the various libraries. The committee working on the state-wide library card has recommended linking the CLSI systems to the electronic mail system. This would allow verification from CLSI

for interlibrary loan. DSLS is presently committed to the further development of the CLSI circulation systems within the state for increased interlibrary cooperation. Funding problems would prohibit a change to any system other than CLSI for the foreseeable future.

1.8.2. CRIARL: The Consortium of Rhode Island Academic and Research Libraries.

CRIARL, an association of academic and research libraries in the state, develops cooperative agreements between its members. The production of a union list of serial holdings for CRIARL members was one of the most important efforts by CRIARL in the past several years. The URI Library was not able to participate in this joint venture, however. The data in the union list was out of date at the time it was produced and has not been updated. CRIARL is currently examining the possibility of updating the list and perhaps putting the data online. The URI Library hopes to be a part of this new effort.

1.8.3. HELIN: Higher Education Library Information Network.

HELIN was formed in 1984 and consists of the libraries of URI, Rhode Island College (RIC) and the Community College of Rhode Island (CCRI). The primary objective of HELIN, as stated in the original cooperative agreement, is "to offer participating libraries the opportunity to jointly acquire and operate a computerized library system." This agreement has resulted in the participation of RIC and CCRI in URI's CLSI circulation system. RIC and CCRI plan to go online with the system in early 1986.

1.9. Fiscal Realities and Options

Thus far this report has discussed a variety of changes in society, the University and the Library. Some of these developments can be characterized as opportunities for the Library. Examples are the University plans for a campus network and the local expertise available from the computer centers on campus. Other factors are more appropriately characterized as changes in the Library's environment that affect the library's traditional role and relationship to its audiences. Examples are the changing expectations of library clientele and the need to manage the increasing complexity of an information-based society.

However characterized, these changes are all forces that indicate a need for the Library to seriously consider its future in general and the role of technology in particular. Many other forces will influence the direction and speed of change. Economic factors will be an overriding influence.

Capital allotments at the University have been historically below the average for other universities of the similar size and character. The University is allotted some $500,000 a year for capital expenditures (not including the Library) for operation of its $100 million facility and programs. The current fiscal climate can only be characterized as "tight." However, State and University administrators have indicated a high priority for the Library and its needs.

Funding options available to the Library for automation are varied. They include incremental increases in the Library budget, special appropriations through the Commissioner of Education or the general University budget, fund raising activities, a

special request to the State legislature, a bond issue, LSCA funds, a percentage of overhead money, and allocations from the regular Library budget. Some type of special funding is critical. While an option, the decision to fund automation completely through the regular Library budget is considered a last resort since it would come at the expense of regular Library acquisitions.

2. Library Automation at URI

2.1. Introduction

The Library has many areas that make extensive use of the computer. Indeed, with the exception of the two computer centers, the Library is arguably the most automated unit at the University. The following is a brief list of all current, direct uses of computers at the Library:

-- Cataloging: Remote connections are made to OCLC for the identification of cataloging data and the production of catalog cards.

-- Serials: An IBM System/36 is used for production of the printed serials list and maintenance of serials data.

- Administration: The IBM System/36 is used for word processing and PC networking.

-- Reference: The URICA service provides online search services.

-- Circulation: A CLSI LIBS 100 system is used for complete automation of circulation functions.

-- Interlibrary Loan: Two computer systems provide electronic transmission of loan requests and replies to other libraries. OCLC is used for out-of-state requests and a system supported by the Department of State Library Services is used for in-state requests.

-- Microcomputers: The Library has several microcomputers used by faculty and staff for a wide range of applications such as word processing, spread sheet analysis and small database applications.

The list is an impressive one. Interestingly, there is little commonality other than the use of the computer in each area. In some applications the Library has relatively little money and staff development time invested in the system; in others, the investment is considerable. In some areas the Library has many options from which it could choose an alternative

system or vendor; in others, the choices are either very limited or, in practical terms, non-existent. While in most areas the introduction of the computer has been very successful, in others, success has been difficult to achieve.

In considering this wide variety of computer applications the Committee decided it would be best to focus its analysis of current Library automation where the computer has had the most impact (good or bad) and where the Library has significant investments of time and money. There was unanimous agreement that in light of these criteria there were three critical areas: (1) OCLC in cataloging, (2) the CLSI system in circulation, and (3) the use of the computer in the production of the Library's serials list.

The remainder of this chapter is a detailed examination of each of these three systems. For each area the discussion is composed of two parts. The first is a descriptive presentation, including the history of the system at the URI Library and important system characteristics, such as size and quality of the database. A second section focuses on analysis. This section reports on extensive interviews and research by the Committee on the success or failure of these systems at the Library. The analysis is supplemented by a common table for each system. The table is a detailed examination in summary form of both the descriptive characteristics and perceived success of the systems at the Library.

2.2. OCLC

2.2.1. Background and History

OCLC, established in 1967 as the Ohio College Library Center and now the Online Computer Library Center, is a self-supporting, non-profit, membership organization of 4,800 actively participating libraries. OCLC began offering online access to its database in 1971. The database now contains over 11.5 million records with about 23,000 added per week. The cooperative efforts of the participating libraries, especially the Library of Congress and the National Library of Medicine, have been responsible for a system that supports cataloging, resource sharing and other computer-assisted operations in libraries nation-wide. While participating libraries are primarily from the United States, libraries in Australia, Canada, Denmark, Finland, France, Ireland, Mexico, Netherlands and the United Kingdom are included.

In the fifteen years OCLC has been in existence, its database has developed into a remarkable collection, unequaled in depth and comprehensiveness. It is not surprising that the records in OCLC are predominantly English language (71 per cent) and that the type of record represented is primarily the book (84 per cent). The depth and strength of the database is more apparent in the reverse of these figures. If 71 per cent of the records in a database of over 11.5 million are in English, then nearly three and a half million bibliographic records are in other languages; if 84 per cent represent books, nearly two million records represent serials, sound recordings, films, music scores, maps and other material. Supplementary files for the cataloging process are a Name-authority for personal, corporate,

conference and series names. A Name-address Directory of publishers, vendors and professional organizations is also available.

When a library uses an OCLC record, its three letter code is added. There are now nearly 180 million location symbols and these locations are utilized by the interlibrary loan subsystem for electronic library-to-library communication. In active use only a couple of years, the subsystem processes some 35,000 borrowing requests per week from 2,300 users. Other OCLC subsystems are for acquisitions and serials control.

At the URI Library the conversion was made from a manual to a computer-assisted cataloging operation in 1972 with the acquisition of two OCLC terminals. The following year, 11,042 titles were cataloged through the system. The quality of records was an initial concern and at the beginning only Library of Congress records were used. As the records contributed by member libraries improved, more were accepted and by 1980, records were found for 95 per cent of incoming books. During FY 1983, 18,674 titles were cataloged online with OCLC. The CCE Library received a terminal in 1975 for access to the holdings of the main Library. In 1979 CCE received its own profile for full use of the system. The Pell Library began to catalog incoming materials on OCLC in 1984.

2.2.2. Analysis

The use of OCLC has been very successful at URI. Most of the problems with the system are not major but, if addressed by OCLC, would provide important enhancements. For example, when

the system displays a record it shows an "official" record(s) in the database. Any changes or enhancements made to this record by the local library are reflected in the printed catalog cards but not in the database. Another example is that methods of searching the database have remained basically the same since the beginning and are crude compared to modern information retrieval systems.

These inadequacies should not be over-emphasized, however. The URI Library is typical of most libraries in the country where OCLC has become an integral part of the cataloging process. The OCLC database is a massive warehouse of bibliographic data where high quality bibliographic records are found for nearly all new acquisitions.

Table 2-1: OCLC

A. Description

1. Database

a. Number of records:	Approximately 225,999 URI bibliographic records.
b. Type of record:	Cooperative cataloging by 4800 participating libraries.
c. Rate of change:	Five to ten changes per month.
d. Rate of update:	URI produces approximately 2,000 records per month.
e. Size:	Nearly 12 million bibliographic records.

2. Performance

a. Functions:	Primarily shared cataloging for production of printed catalog cards. System also used for Interlibrary loan.
b. Response time:	National average reported at 6.2 seconds; local response time (monitored at BU) reported at 21.5 seconds.
c. Type of access:	Combination of author and title: also through various "key" fields, such as ISBN,OCLC Number, LCCN, etc.
d. Hit rate:	Approximately 94%.
e. Down time:	National average reported at 0.5% in March.

3. Present status

a. Hardware:	N.A.
b. Work stations:	Six local terminals with remote connection to OCLC data base; one terminal is an M300, a slightly modified IBM PC.
c. Cost:	Average cost per month is $6,000 (includes maintenance, telecommunications, use charges, etc.)
d. Staffing	
1. Faculty:	Five full time catalogers consult OCLC regularly; other faculty use the system frequently for information and verification of bibliographic data.
2. Clerical:	In acquisitions, seven positions use the system intermittently at an average of one hour per day; in cataloging nine positions use the system regularly for at least three hours daily; in interlibrary loan one staff member uses the OCLC loan subsystem full time.
3. Student:	In acquisitions six students at five hours weekly.

4. Future

OCLC is continually developing some new feature or service. The Interlibrary Loan subsystem is an example. Other important developments are new services for libraries to perform retrospective conversion on the OCLC data base. OCLC has recently developed a service, Microcon, using its new IBM PC M300 terminal.

B. Analysis

1. Quality

a. Response time:	Acceptable.
b. View of quality	
1. Faculty:	Excellent.
2. Administration:	Excellent.
3. National:	Wide acceptance.
4. State & regional:	Wide acceptance.
5. Compatibility:	MARC records; Wide acceptance.
c. Type & size of data base:	The largest bibliographic data base available.
d. User friendliness:	Considered good for staff use.
e. Down time:	Last few years have seen improvement; not considered a problem at this time.

2. Costs

a. Staffing:	Considered moderate and less expensive than manual cataloging process.
b. System costs:	Reasonable.

3. Perceptions

a. Success/Failure	
1. Administration:	Excellent system. Costs have not gone up as much as anticipated.
2. Faculty:	Excellent source of cataloging records. Needs subject access and better authority control. Generally the system is excellent and improving all the time.
3. Clerical:	A neccessary and useful tool. System is easy to use and hit rate is excellent. Most concerns of staff are with the tedium of working on the terminal.
b. Value to library	
1. Administration:	All levels, administrative, faculty and clerical
2. Faculty:	View OCLC as an essential and successful automated cataloging system.

4. Future

The use of OCLC in the cataloging process is nearly a standard for the academic library. Whatever the URI Library's plans for automation in the future, it is certain that OCLC will be a part of it. Because of its widespread acceptance, the Library is also assured that any vendor will provide acceptance of OCLC records.

2.3. CLSI

2.3.1. Background and History

The Library operates a CLSI LIBS 100 System for the automated circulation of books and journals. The LIBS 100 is a turnkey system which includes software modules for circulation, book acquisitions, materials booking, reserve book room maintenance, and a public access catalog. At the present time, the Library uses only the circulation module for all standard circulation activities including the processing of loan transactions, maintenance of patron and material information, and the printing of patron notices and management reports.

The CLSI system was originally purchased in 1978 upon the recommendations of the circulation supervisor, the Reserves Room Supervisor, and the Library Budget Task Force. The automated circulation system was intended to replace the manual system which was judged to be inadequate for a University Library.

During the year following the purchase of CLSI, circulation staff began creating a database of short-title records for the system. By July of 1979, 25,000 records had been entered. From the summer of 1979 until August of 1981 implementation of the CLSI system was held in abeyance, due to the lack of a permanent full time circulation supervisor. During that time, however, the database was enlarged, library patrons were issued library cards with bar codes for use with the system and procedure manuals were started. In August of 1981, four years after its purchase, the system went into operation.

Over the next two years the CCE Library began preparations for its use of the CLSI circulation system. The CCE Library

received its own CLSI terminal linked to the central system and came "online" in the summer of 1984.

In 1984 several important changes also occurred. The URI Library entered into a consortium with the libraries of Rhode Island College and the Community College of Rhode Island. The group was named HELIN (Higher Education Library Information Network) and its purpose was to develop an automated circulation system based at the URI Library using CLSI. With the HELIN agreement a significant upgrade of the system took place. Perhaps the most important enhancement was the capability of the system to accept MARC records as the basis for bibliographic records with a ten fold increase of storage capacity to store the data. The URI Library's OCLC tapes containing the MARC records of cataloging from 1972 to 1984 are now loaded in the CLSI database. Current tapes are being loaded monthly.

2.3.2. Analysis

CLSI is considered by all a vast improvement over the previous manual circulation system. A turnkey system designed primarily for public libraries, it is reasonably user-friendly. It performs all the expected circulation functions such as generation of overdue notices, renewal processing, placing holds and notification of book availability to patrons. Student assistants are trained fairly readily to perform basic functions. The task of inputting bibliographic records, however, was much more difficult and resulted in many inaccurate records. The OCLC MARC records provide quality records but much cleanup of the database remains to be done.

Other problems have been identified. The system sets loan periods based on borrower status, rather than on type of material. It is also extremely difficult and cumbersome for the system to handle simple circulation of serials and multi-volume sets. A library technician in circulation spends much time setting up separate files for serials to record volume numbers and uses considerable ingenuity to put call number and title change information into the notes field. Catalogers are currently grappling with many call number problems such as "bound withs. It has become increasingly evident that the interface between the CLSI system and MARC records has significant limitations.

As part of the 1984 upgrade, URI has additional software other than circulation. These modules include book acquisitions, materials booking (such as audio visual material), reserve book room, and the public access catalog. There has been particular disappointment with these modules. The URI Library and the other HELIN libraries have evaluated these modules in some detail and each one has a variety of critical flaws. Because of these flaws, the URI Library has no plans to use these modules despite their availability. The other HELIN libraries have also either abandoned or modified their plans considerably.

From the URI Library's perspective there are also problems resulting from the consortium arrangement. The CLSI system stores all records in one large file. As a result, when more than one library uses the same OCLC record only one library's bibliographic record is maintained; all others are overlaid by later uses of the record.

Table 2-2: CLSI

A. Description

1. Database

a. Number of records:	283,000 bibliographic records (April, 1985).
b. Type of record:	Approximately 50% of total are MARC based records from OCLC; other half are local, non standard "Short title" records.
c. Rate of change:	Same as OCLC, 2,000 monthly.
d. Rate of update:	Same as OCLC, five to ten monthly.
e. Size:	N.A. Size of data base is equal to number of records in system.

2. Performance

a. Functions:	Circulation control; other optional modules include Book Acquisitions, Reserve Book Room, Materials Booking, and Public Access Catalog. These are not currently used.
b. Response time:	Satisfactory.
c. Type of access:	Circulation staff.
d. Hit rate:	Approximately 60% of the total Library collection is represented in the data base.
e. Down time:	Minimal.

3. Present status

a. Hardware:	CLSI System/73 (a DEC PDP 11/73 minicomputer).
b. Work stations:	Seven terminals.
c. Cost:	Approximately $300,000, $13,000 is spent annually for maintenance support.
d. Staffing	
1. Faculty:	10-20% of Library Systems Analyst.
2. Clerical:	Five; four Library Tech and one Classified Librarian interact with CLSI as an intimate and constant part of their daily work.
3. Student:	75 students at a total of 190 hours per week at Circulation desk and 100 hours per week on data input tasks.

4. Future

CLSI is constantly working on enhancements and improvements to the system. Modules other than the primary Circulation function are available, such as Public Access Catalog, Acquisitions, and Reserves.

B. Analysis

1. Quality

a. Response Time:	Acceptable, but can be slowed by other programs and funcitons.

b. View of quality

1. Faculty:	Most critical problem is seen as numerous problem records that result from incorrect input and attention to records the system does not handle well automatically, e.g., serials and multi-volume records.
2. Administration:	Disappointed with performance as a result of recent upgrade but encouraged by CLSI's response and work to improve performance.
3. National:	CLSI is largest turnkey vendor of library systems and thus has wide acceptance. CLSI's customer base, however, is largely public, not academic, libraries.
4. State & regional:	CLSI is the dominant library automation system in Rhode Island and a strong presence regionally in New England.
5. Compatibility:	Processes MARC tapes from OCLC; otherwise no compatibility with other systems.
c. Type & size data base:	Data base is a mixture of good MARC records and very brief short title records that are often incorrect. These discrepancies must be addressed. However, there is no systematic method to identify particular types of records on the system.
d. User Friendliness:	Satisfactory. Staff training time is short for basic processes, longer for input.
e. Down time:	An occasional occurrence. Down time is most likely and most troublesome when major system changes or enhancements are made.

2. Costs

a. Staffing:	System requires considerable staff attention. Even with MARC records this is likely to continue due to records not processed by the system, such as multi-volume records.
b. System costs:	As a turnkey system, the cost of equipment, software and maintenance are high.

3. Perceptions

a. Success/Failure

1. Administration:	There has been considerable dissappointment with the software modules other that the primary circulation system, e.g., book acquisitions and AV booking. System is not a flexible one (e.g. loan periods set continue to be a problem.
2. Faculty:	Improvement over manual system but a general impression that CLSI is not the best system for an academic library of our size and type.
3. Clerical:	Great improvement over the manual system.

b. Value to library

1. Administration	There is a certain investment in the CLSI system. This investment must be considered but not to the exclusion of the consideration of other systems that might bring significant improvements.
2. Faculty:	An automated system is seen as having value but CLSI itself is not perceived as especially important or valuable to the Library.
3. Clerical:	An automated system is a great help in processing circulation activity.

4. Future

a. Capability:	As one of the largest and oldest vendors of turnkey systems, CLSI holds promise of development and improvement.
b. Regional:	CLSI is the dominant library automation system upon which any state-wide interlibrary systems will be developed.

2.4. The Serials List

2.4.1. Background and History

The serials list is a locally produced compilation of all URI Library serials, including holdings data for current and ceased serial titles, location data, and cross references. The serials list is a finding aid for Library staff and patrons. It is the most accurate and current single source of information on Library serials.

The serials list data has been stored since late 1984 on a small Library minicomputer, an IBM System/36. The System/36 is used to print the serials data in paper format, producing a hard copy serials list in alphabetical order by main entry with monthly updates. Several copies of the printed list are then made available in the Library. When discussing the serials list, therefore, it is necessary to observe the distinction between the printed, public access serials list and the serials list stored on the System/36.

Historically, serials data accumulated over many years. It was then coded onto punched cards and printed as a hard copy list on the University's mainframe computer. In 1984 it became necessary for the Library to find another method of producing the List and the System/36 was purchased. The serials data was loaded into the System/36 in late 1984. This procedure enabled the Library to retain all the machine readable data previously developed, but it meant that the format of the old punched card system was also retained. Additionally, because of the changes brought about by AACR2 and a serials reclassification project in Summer 1984, the data loaded into the System/36 was not com-

pletely up to date. A large backlog of changes, corrections, and updates also had to be entered. The first printout from the System/36 serials list was produced in June, 1985.

2.4.2. Analysis

The System/36 based serials list has been in existence for a short time but the serials data is the same as that used in earlier versions of the List produced by the University's mainframe computer. It is not a serials management system as it is not used for check-in, claiming, and other important functions for serials management. Perceptions of the quality of the current system have focused on two areas of concern: (1) Quality of the System/36 in producing the serials list in its present format, and (2) quality of the serials list itself in terms of flexibility and relationship to other Library systems.

(1) Quality of the serials list in its present format.

The System/36 is successful in producing the serials list in its present format. Updating and entering data and printing the List with the Library's own staff at its own convenience provides more control than was possible with the earlier arrangement with the computer center. Since most of the backlog of corrections and updates has been entered, the quality of the new List is superior to the old which was updated by hand in the period between printouts. The printed serials list remains an indispensable finding aid used by the staff and patrons to locate serial holdings in the URI libraries.

Inadequacies with the System/36 serials list are the result of the limitations inherent in a locally produced system. It is

not an online public access system, but a device for providing a hard copy list. Although the staff would like other products to be produced (e.g. printouts by subject area, printouts of new titles by subject, etc.), these are difficult to provide with data which was originally developed to supply an alphabetical listing only. There is also no software available for manipulating the data; it must all be developed in-house. Staff perceptions of this new system indicate that the quality of the System/36 serials list in its present format is good, but its usefulness is limited.

(2) Quality of the serials list: flexibility and compatibility.

The second area of concern addresses the question "What is the serials list and what is its function?" If the serials list is considered solely a finding aid to identify the Library's current and retrospective serial titles and holdings, the System/36 is adequate to produce it for the foreseeable future. If the serials list were to be developed into a serials management system (with control of all serial functions), the System/36 lacks the software and capacity for that task. If the serials list were to be part of an integrated system with the Library's other computerized bibliographic systems, it is also inadequate. Because the data are non-standard -- non-MARC and locally produced -- they are incompatible with the Library's OCLC and CLSI systems as well as with other libraries with which the URI Library may wish to cooperate.

In conclusion, as a device for producing the printed serials list -- an important tool for staff and patrons to locate infor-

mation on URI serials -- the System/36 serials list is sufficient. However, the system is very limited: it is successful at only one task. It is a locally developed system with local data. It lacks the software to produce a variety of outputs and it is not compatible with other bibliographic systems, both within and outside the Library.

Table 2 - 3 Serials List

A. Description.

1. Database
   - a. Number of records: 18,000 (April 1, 1985).
   - b. Type of record: All locally produced; non-MARC.
   - c. Rate of Change: 25 new records per month.
   - d. Rate of update: 50 corrections per month.
   - e. Size: 1,250,000 entries.

2. Performance
   - a. Functions: Production of printed Serials List and associated processing (add, update, delete records).
   - b. Response time: Immediate.
   - c. Type of access: Online access, staff only for data entry: printed list for public access; online access is by a local (line) number.
   - d. Hit rate: N.A.
   - e. Down time: Since installation (Dec. 1984) no down time.

3. Present status
   - a. Hardware: IBM System/36, Model 5362.
   - b. Work stations: Five, four of which are IBM PC's.
   - c. Cost: $50,000; System also purchased to provide administrative word processing.
   - d. Staffing
     - 1. Faculty: Two. 10-20% of Library Systems Analyst; 10-20% of Acquisitions Librarian.
     - 2. Clerical: One Library Tech at 50%.
     - 3. Student: None.

4. Future

   Some limited expansion is planned, e.g. additional lists by library (Pell, CCE holdings) and current holdings.

B. Analysis.

1. Quality
   - a. Response time: Excellent.
   - b. Views of quality
     - 1. Faculty: Information excellent if kept up to date.
     - 2. Administration: All programming must be locally developed limits possibilities for additional access and other enhancements.
     - 3. National: Local system.
     - 4. State & regional: Local system; no possibilities for regional cooperation.
     - 5. Compatibility: Hardware is compatible with IBM PC's and OCLC's M300 terminal; otherwise data not compatible with other library systems.

c. Type & size of database: Quality of information excellent but non-standard: sufficient for production of printed Serials List.

d. User friendliness: Staff training not extensive.

e. Down time: None to date.

2. Costs

a. Staffing: Too much professional time required for development of local programs.

b. System costs: Reasonable.

3. Perceptions

a. Success/Failure

1. Administration: Sufficient for production of printed Serials List. Adequate as an interim step until a complete serials system with standard records and online access is available.

2. Faculty: Current printed list not current. Printed supplements not used by patrons.

3. Clerical: Changes to List are easier to make.

b. Value to library

1. Administrative: Allowed Library to use all data from old Serials List programs. Information in List itself very valuable; lists all current and retrospective serials holdings. Should solve problems of currency that existed with old system.

2. Faculty: Indispensable for Public Services staff.

3. Clerical: Improvement over hand updates of List under old system.

4. Future

System has limited future capability primarily because all enhancements require local development. From the beginning system has been seen as an interim step until Library can acquire a complete, full featured serials control system. As a local system with unique, non-standard records, there is little if any possibility for cooperative efforts with other libraries.

3. Library Needs Analysis

3.1. Introduction

A primary goal of the Library is to administer and effect an organization and structure on a collection that is multi-faceted, variable, complex and fluid -- characteristics in direct opposition to organization and structure. It is this basic conflict that is much of the challenge of library organization.

However, the most challenging task of all is not simply to organize this material but to provide an organization for hundreds of thousands of bibliographic items that makes it as simple as possible for a student or faculty member, representing a wide range of library skills, to find a single needed item easily. Further complicating the task, patrons needs are all too frequently based on incorrect or out of date information or on a need not clearly understood by the patrons themselves.

The ability to retrieve a single item from millions of records quickly and easily is a primary reason why the computer holds such promise for libraries. In considering where the computer can provide the greatest benefit it is useful to examine some typical library processes in detail. As a complex organization, it is no simple task to select "typical library processes" from hundreds that each make important contributions. However, for the purpose of analysis, the objective is to select a limited number of processes that would be representative.

The URI Library, for example, deals with a very large variety of material such as books, microforms, newspapers, serials, etc. However, the Committee decided to concentrate on two types of materials as both representative and of primary concern to the

Library's community, books and serials. With these materials, numerous, important processes can occur: cataloging, ordering, circulation, patron identification, binding, replacement and so on. The Committee decided to concentrate on two processes: the search for an item by a patron and the acquisition of an item by the Library. These two perspectives represent both the public and technical processes of the Library.

The following chapter is thus in four parts. The public and technical processes are considered for both books and serials. The first section considers a patron in need of a specific book with a book title as the identification; the next section is a patron needing a specific issue of a serial; the third section addresses the placement of an order for a new book by the Library; the final section deals with the placement of an order for a new serial subscription by the Library.

Each of these sections follows the same format. A chart graphically depicts the processes involved preceded by a brief explanatory narrative. This is followed by a conclusion indicating the primary areas of concern in the process.

Briefly, the charts use four symbols. The rounded rectangle represents processes or steps; the flat, open-ended rectangle represents files; the heavy-sided square represents areas outside the analysis; and, finally, the arrows that connect these symbols indicate the flow of information and materials. The numbering of the processes is not significant and is done primarily for identification. A fuller explanation of the symbols used in the charts may be found in the appendix.

3.2. Patron Search for a Book

3.2.1. Narrative

Figure 3-1 is a diagram of a patron's search for a book. The process of a patron in need of a specific book title begins at the Author/Title catalog. If the patron locates the title and call number, the book stacks are searched. If the book is not found in the stacks, the next place to search is temporary shelving, where books are kept that have recently circulated but which have not yet been shelved. If not on the temporary shelves, the patron must consult with the circulation staff to determine if the book is checked out.

If circulation's records indicate the book should be on the shelf or if the book is not in the circulation system a search is undertaken by the Library's circulation staff for a total of two years. If the book is not located after this time, it may be replaced.

At various stages in this process, the patron may use interlibrary loan (ILL) and request the book from some other library. If ILL is used it may take two to four weeks before the book is received.

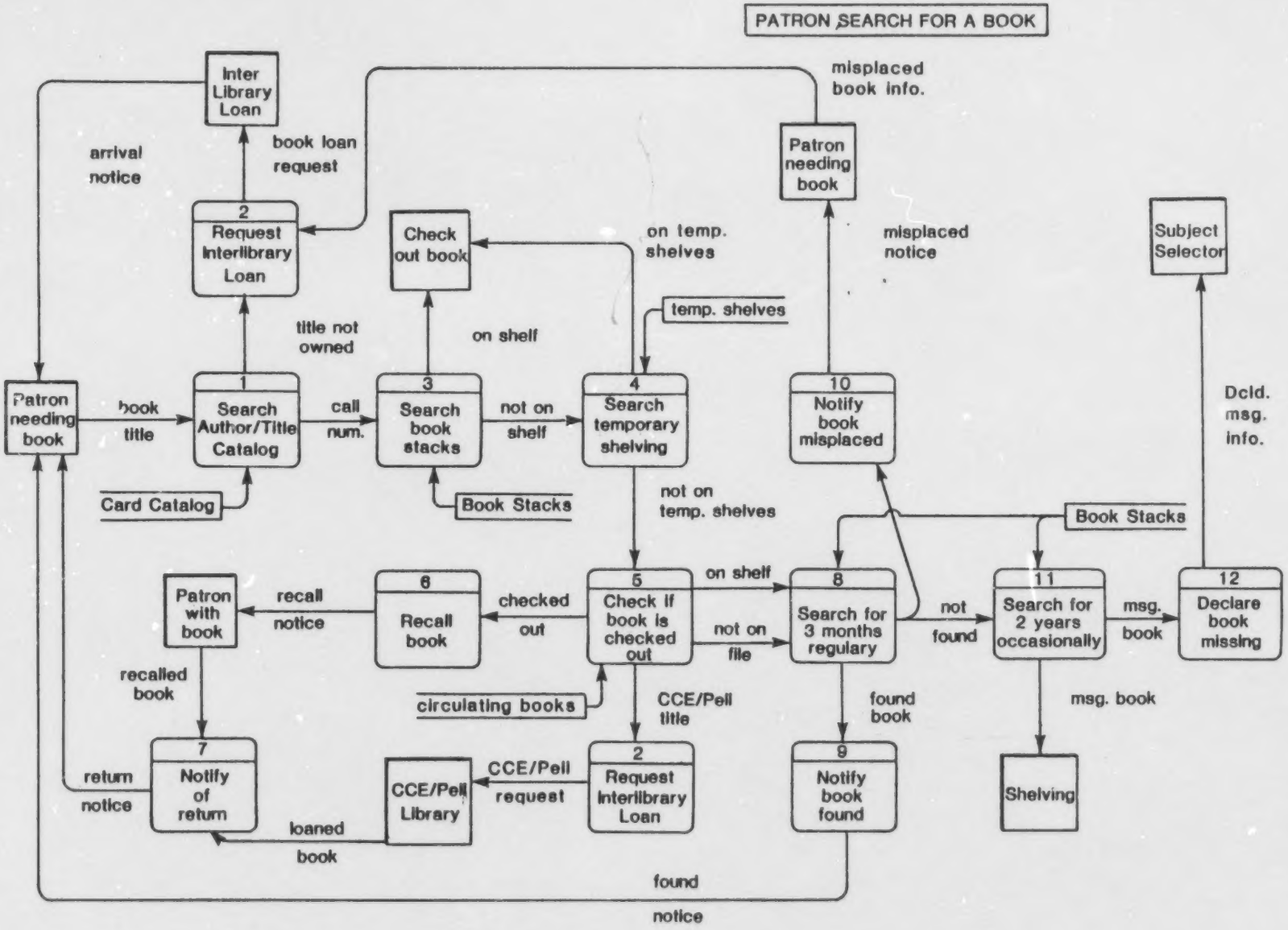
PATRON SEARCH FOR A BOOK
Inter Library Loan
arrival notice
book loan request
misplaced book info.
Patron needing book
2
Request Interlibrary Loan
Check out book
on temp. shelves
misplaced notice
Subject Selector
temp. shelves
title not owned
on shelf
Patron needing book
book title
1
Search Author/Title Catalog
call num.
3
Search book stacks
not on shelf
4
Search temporary shelving
10
Notify book misplaced
Dcld. msg. info.
Card Catalog
Book Stacks
not on temp. shelves
Book Stacks
Patron with book
recall notice
6
Recall book
checked out
5
Check if book is checked out
on shelf
not on file
8
Search for 3 months regulary
not found
11
Search for 2 years occasionally
msg. book
12
Declare book missing
recalled book
circulating books
CCE/Pell title
found book
msg. book
7
Notify of return
return notice
CCE/Pell Library
CCE/Pell request
2
Request Interlibrary Loan
9
Notify book found
Shelving
loaned book
found notice

Fig. 3-1

3.2.2. Conclusions

The most critical step in this process is the first, searching the Author/Title catalog. If the Author/Title catalog is correctly selected as the place to start the search and if the title is found in the catalog, the patron may assume the Library owns the book and can begin a search for the physical volume.

The card catalog is at once the most useful and most deceptive tool in the library: useful because it is the best authority on what the Library owns and the key to locating material; deceptive because it is a superficially simple tool to use.

Many patrons think of using the Author/Title catalog in much the same way they use the telephone book: finding information, be it call numbers or phone numbers, through a simple alphabetical search. However, the information in the catalog is much more complex than names in a phone book. Authors of books may not be persons at all but corporations, government agencies, and conferences. Some books may not have an author, or the author may write under one name and be known under another. The author may be one of several authors of one book. Each of these situations presents a problem requiring special and exceptional treatment. There are numerous other examples of exceptions that can arise, but the primary cause of this complexity is the variability of bibliographic information.

The object of searching the card catalog is, of course, to locate the book. Figure 3-1 shows there are several alternatives available to the patron when the needed title is not in the catalog or not on the shelf. In such situations the patron may make use of a variety of Library services such as reference,

circulation, and interlibrary loan. If all these services are consulted and used, it would be extremely rare for a patron not to eventually receive any needed title. However, the these services are often overlooked by the patron either from a false assurance in the belief that the title is not owned by the Library or from a lack of awareness of the alternatives, particularly reference and interlibrary loan.

The computer can greatly aid in the solution to both these problems. First, in the identification of items, numerous studies of online catalogs indicate that patrons are confident their searches are more successful in identifying items than a search of the traditional card catalog. This is partly a result of the computer's speed in searching a large database. The searcher is freed from rules for strict alphabetization and is able to search for words within titles and even for characters within words. The boolean search capacity of the computer also allows for a much more refined and efficient search strategy.

Secondly, the computer can actively participate in the search process. The traditional card catalog is a passive instrument; it relies primarily on the patron's initiative and knowledge when complexities arise. The online catalog, however, can be an interactive aid in the search process. It can suggest alternative strategies when searches are unsuccessful. These may be in the form of other search strategies or simple suggestions such as "Interlibrary loan may be used for any title not owned by URI. For more information press the Help key or go to the ILL office."

3.3. Patron Search for a Serial

3.3.1. Narrative

Figure 3-2 depicts a patron's search for a serial at the Library. The search for a journal article begins at the serials list. The list provides five critical points of information: (1) whether the Library owns the title at all, (2) if the specific year or volume needed is held, (3) whether the CCE or Pell libraries have holdings, (4) the call number and, (5) the format of holdings (microform, bound or unbound). Each of these points is essential to the eventual retrieval of the needed article and should not be overlooked or misunderstood.

If we presume the title and year are held at the main Library, the patron must make a distinction between current and older issues. If current, issues will be unbound and shelved in the Current Periodical Room; if older, issues may be bound and kept in the bound serial stacks or on microform. Presuming the issue is current the patron searches the current shelves. If not found here, the issue may still be available but in a different location. It may be on the return shelves waiting for reshelving, at the bindery for binding, or, if especially current, it may simply not have yet been received by the Library.

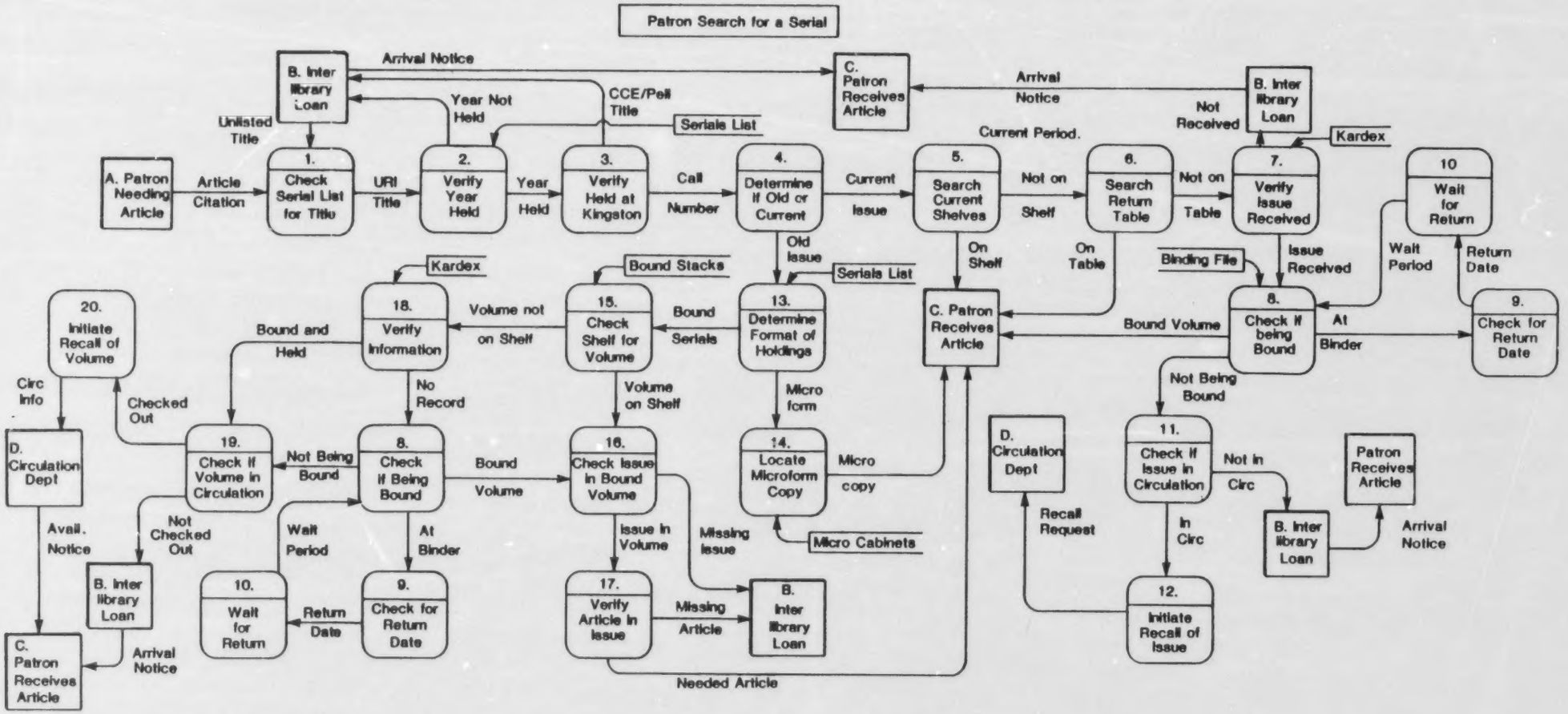

Fig. 3-2

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3.3.2. Conclusions

Several important conclusions can be drawn from the graphic representation of a patron's search for a serial. One of the most critical is that, more than any other area, there are numerous points where the patron's search can fail. The Library may not own the title at all; the title may be owned but the particular year or volume needed is not held; the volume needed may be checked out, at the bindery or in the process of being reshelved; the volume may be on the shelf but the issue may be missing, stolen or never received; the article may be in the Library but in a different format (e.g., microform).

It is the perception of many Library staff that the area of greatest user frustration with the Library is in locating serials. Certainly one cause of the frustration is the greater potential for failed searches. However, there is an another dimension that adds to the problem. A patron can never be certain that an article is not in the Library unless each one of the steps depicted in the chart is followed. The serials list provides information as to titles owned, years held and the format of holdings, but it cannot indicate where a specific issue is at a particular point in time.

For example, most articles needed by patrons are those published within the last year or two. In this typical case it is not clear whether the volume may be bound (thus in the bound stacks), unbound (thus in the Current Periodical Room shelves), in the process of binding (thus not in the Library at all but returning soon), received on microform (thus in the Microform room), or, last but not least, in use by another patron (thus

somewhere in the building). To positively determine that a needed issue of a serial is not in the Library each one of these areas must be systematically checked and searched. This is the only method to determine with assurance that the needed volume is missing and interlibrary loan must be used.

The above paragraph suggests a further element that adds to patron frustration, multiple locations of serials and serials information. Serials are mainly located on the first floor in three separate locations: bound periodical stacks, current periodical room, and microform room. But serial publications are also located on the second floor (e.g. government publications, reference), the third and fourth floors (e.g. monographic series shelved with books), and off-campus locations (e.g. CCE and Pell holdings). General location information is in the serials list but patrons must physically go to each of these locations in order to determine the status of an issue as well as to check files with special serial information (e.g. the file of volumes at the bindery). Moreover, the files involved are not maintained or kept as public access files. For the patron to check them Library staff must be found.

Delays are another area of concern. A source of great frustration for a patron is when an article is owned by the library but missing. In this case the patron must wait two weeks before requesting the item from interlibrary loan. Of course, once requested, there is also a delay before the article is received by interlibrary loan.

Perhaps the most significant factor in the process of locating a serial, however, is the extremely complicated and varied nature of serials themselves. Certainly, books can be bibliographically complex, but they do not compare to the complexity that characterizes the typical serial. Titles change frequently and, occasionally, all too subtly; publication schedules vary from regular, weekly issues to those with irregular, occasional frequency; the publisher, place of publication, format and just about every other aspect of a title can change, yet still be considered the same title; titles can split to form several splinter journals, or merge to form one.

These variations by the publisher are then complicated by the variations of the Library. Library holdings may be incomplete, stopping one year, beginning another and stopping yet again. The format of the serial in the Library may also vary. For example, the Library may hold the same title in three formats, bound, unbound and microform, depending on the year.

The nature of a patron's need for information in serials is another important factor. A patron in search of a book is commonly looking for one or two titles, and occasionally for three or four. A search for more than this is uncommon. With serials, however, the patron is usually looking for five or ten articles on a topic and a search for much more than this is not unusual. If the identification and location of a serial is a frustrating experience then it becomes more frustrating with each iteration of the search.

3.4. Library Processing of a New Book Request

3.4.1. Narrative

Figure 3-3 represents the steps necessary for the Library to process a new book request. A book request can begin with any patron but faculty are a frequent and important source. Once received, the request is reviewed by a Library subject selector in the appropriate area. If approved, the request is forwarded to the Library's area bibliographer for a second approval. It is then that the process of verification begins. The bibliographic information must be verified and it must also be determined that the item requested is not already in the collection or on order. Once this information is determined, the request becomes an order and is sent to a vendor.

When books are received by the Library the invoices are sorted and checked against the on order file. Notices are placed in those books where notification of the book's arrival was requested. The books are then sent to cataloging. When they are cataloged they receive final processing with the adherence of labels and stamps on the book. The book is then ready to go to circulation for shelving.

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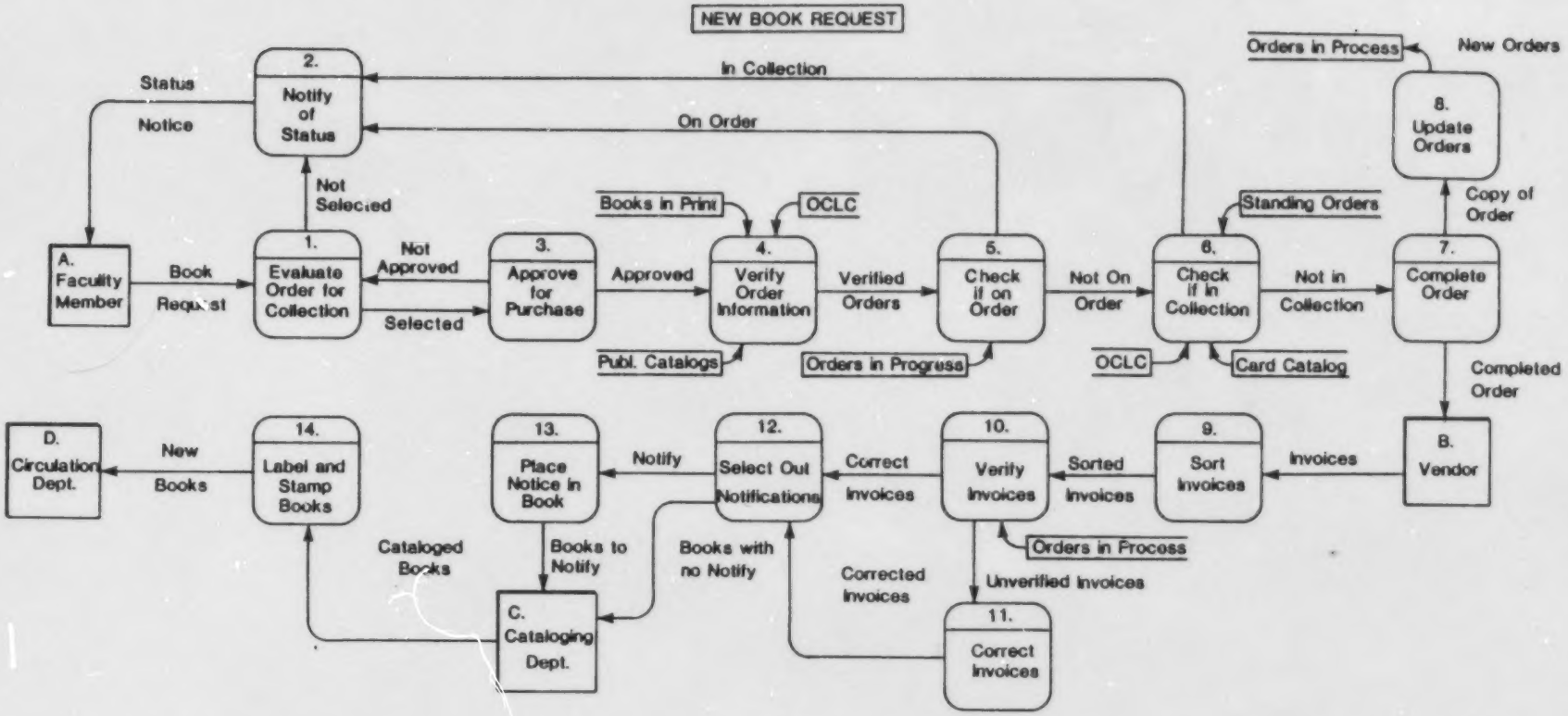

Fig. 3-3

3.4.2. Conclusions

The first conclusion that can be made from this analysis is that the book order process involves an extensive number of files. OCLC, the card catalog, standard published bibliographic tools such as Books in Print, a local orders-in-process and standing order file are all regularly checked as a part of the book order process. These files are important primarily because they ensure that the Library orders the correct book by verifying the bibliographic information and, secondly, that the Library does not re-order a book already in the collection.

Each file has its unique characteristics and methods of access. Each one differs in currency, depth of information, accuracy, etc. This is one of the challenges and difficulties of the book order process: to be able to comprehend and effectively manipulate these files so that the correct book is ordered and that books already owned are not re-purchased. Both the complex bibliographic nature of many books and the various characteristics of the several files involved are a significant deterrent to this goal.

A second conclusion is that there can be major time delays in the book order process. This is primarily because the order is handled by many different departments and people. For example, the book request must receive approval by two different Librarians before it reaches the acquisitions process. It may then be several weeks before the acquisitions department can begin the process of verification. If easily verified, the request goes to the vendor. Once sent, the order is out of the

Library's hands and it may be anywhere from two weeks to six months before the order is filled.

When received, the book quickly gets to cataloging. It is estimated that eighty per cent of the books are cataloged immediately via OCLC. Twenty per cent are delayed for one reason or another and require special attention. In the extreme case, a book that requires original cataloging by a Library cataloger may be delayed as long as several months. Once cataloged, books are typically on the shelves within a week.

For a patron in need of an important new book, these delays can be significant and vexing. Of course, special attention can be given to new books of critical importance when the need is known.

3.5. Library Processing of a New Serial Request

3.5.1. Narrative

Figure 3-4 represents the steps necessary for the Library to process a request for a subscription to a new serial. As with requests for new books, the request for a new serial typically begins with a faculty member. The approval process is also similar except that an extra evaluative step is added. After the first review by a subject selector and subsequent ranking by an area bibliographer, new subscriptions are then selected by a Library Committee, the Collection Management Advisory Committee. Once selected, an order is sent and Library files are updated.

All serial issues published more than once per year are checked in at the Current Periodicals Room where the Kardex file is maintained. New periodical issues are identified during check-in and OCLC is then searched for bibliographic information. The new issue and the OCLC record proceed to Cataloging. Once cataloged, three files are updated: the Kardex (for regular check in of current issues), the checklist (serves as a record of bound holdings), and the serials list (serves as the location and holdings tool for public access). The first issue itself goes to the Current Periodicals Room for final labeling and shelving. A notice of receipt is also sent to the faculty member who made the original request for the title.

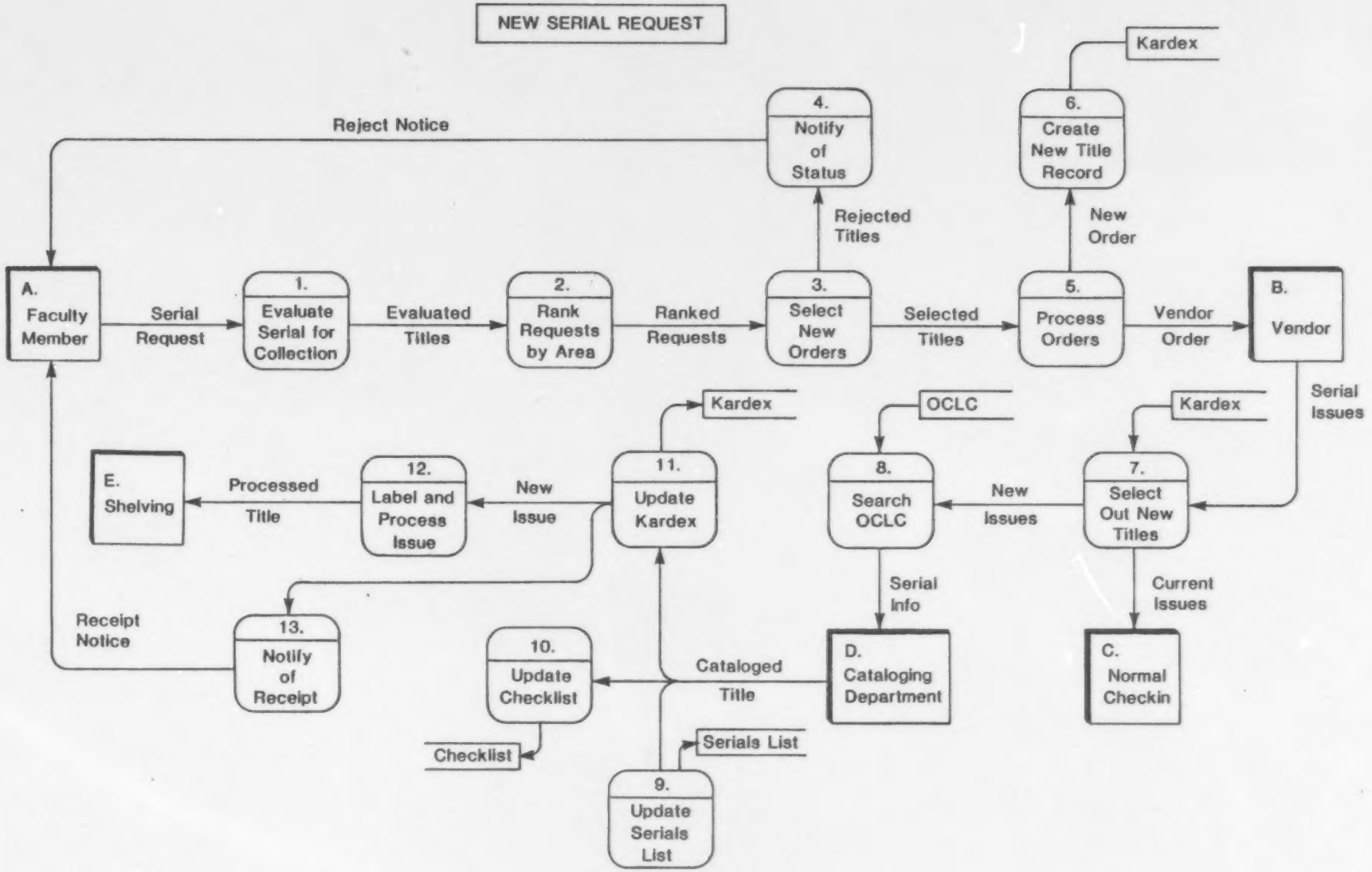
NEW SERIAL REQUEST
A. Faculty Member
Serial Request
1. Evaluate Serial for Collection
Evaluated Titles
2. Rank Requests by Area
Ranked Requests
3. Select New Orders
Selected Titles
5. Process Orders
Vendor Order
B. Vendor
Serial Issues
Reject Notice
4. Notify of Status
Rejected Titles
6. Create New Title Record
New Order
Kardex
E. Shelving
Processed Title
12. Label and Process Issue
New Issue
11. Update Kardex
Kardex
OCLC
8. Search OCLC
New Issues
7. Select Out New Titles
Kardex
Receipt Notice
13. Notify of Receipt
10. Update Checklist
Checklist
Cataloged Title
D. Cataloging Department
Serial Info
C. Normal Checkin
Current Issues
Serials List
9. Update Serials List

Fig. 3-4

3.5.2. Conclusions

One of the most critical steps in the acquisition of a new serial relates to the check in process. New titles are identified during the normal check-in process of all serials and it can be difficult for staff to identify new titles. This is especially understandable when one considers how often current serials change (is this the first issue of a new serial or a current subscription with a new title?) and the number of sample issues the Library receives from numerous publishers.

Another important factor to consider is volume. The Library subscribes to approximately 7,000 serials. Some are received weekly (52 issues annually), some monthly (12 issues) and others quarterly (four per year). An average of eight issues are received per year per title. This means the Library processes 56,000 individual serial issues per year. Thus, in a five day work week, Library staff check in greater than 200 issues per day on average. During this process, the issue must be correctly identified, recorded as received, new subscriptions identified and changes in format, title or content noted.

A final conclusion is that, similar to the process for book orders, there are numerous files involved. Four files are part of the process for a new serial subscription and three of the four are locally maintained. Each file has some unique information. The Kardex is the only file with current holdings information, the checklist maintains complete information on bound holdings and microforms, and the serials list has unique holdings and location information for patron access. For each new subscription, information must be separately created three times, once

for each file. This duplication of effort requires much staff time and increases the possibility of incorrect information being entered or information never entered at all.

3.6. Conclusions of the Analysis

In examining trends in library automation in general and current Library automation at URI in particular, the Committee determined two major goals of an automation program for the URI libraries: 1) to meet the needs of Library users in a timely fashion and 2) to provide the best possible bibliographic control of Library holdings. These two goals in fact define the mission of the academic library. Improved library service will only be realized with the implementation of systems -- whether automated or manual -- which provide enhanced service to users and better bibliographic control.

The Committee identified a number of specific criteria which an automation program must meet in order to accomplish these goals. These criteria are all considered essential for a successful library system. They are listed below and are not ranked in any particular order:

-- The system will meet national standards of uniformity and accuracy.

-- The system will be able to integrate with other (internal) Library systems.

-- The system will increase staff productivity and efficiency; it will eliminate/reduce duplication of effort.

-- The system will contribute to a better working environment for the staff.

-- The system will improve public access; patrons will be able to use it easily and effectively.

-- The system will be accurate; it will maintain a high degree of quality control.

-- The system will provide timely, up-to-date information.

-- The system will be cost-effective.

-- The system will be flexible and adaptable; it will evolve to meet future changes.

-- The system will be able to communicate with outside systems, regionally and nationally.

-- The system will accept present Library files and data, when the investment in those files is significant and valuable.

Although the above criteria for a successful library system were developed in the context of an automated environment, they can also serve as standards for effective library service. They support the overall goals of improved service to users and better bibliographic control, meeting the needs of both patrons and staff. Any library system which meets the same criteria would be acceptable.

The Committee's examination of current Library programs -- a combination of manual and automated systems which have developed over time -- revealed that the present system does not meet many of these criteria. In an environment characterized by increased growth of publication, greater user expectations and demands, and the development of more sophisticated methods of information storage and retrieval, the current system strains to meet present needs and will be inadequate for future needs.

4. Recommendations

The Committee on Computer Applications in the Library has studied and evaluated critical processes within the Library and reviewed the current state and future potential of library automation. On the basis of its analysis the Committee makes the following nine recommendations for the development and implementation of computerized systems at the University of Rhode Island Library over the next five years:

1. The Committee recommends that: the Library move toward the use of a single, integrated system incorporating all significant Library functions except those provided by the shared cataloging of OCLC.

In chapter one it was noted that the integrated system is the most important development in contemporary library automation. A single system that would incorporate all Library functions has enormous potential benefit for both patrons and staff. We recognize that for many reasons, full and complete implementation of an integrated system is not possible for several years even if the best possible fiscal conditions are assumed. However, we recommend that until implementation, the Library make every decision regarding automation with an integrated system as its eventual goal.

2. The Committee recommends that: the Library select a full-featured serials control package by academic year 1986/87 and that it be implemented by academic year 1987/88.

Our analysis clearly shows that serials is the most complex and frustrating area for patrons and staff alike. With its

numerous serials-related files, each with major differences in content, currency and other areas, the Library is unintentionally adding to the difficulty in working with serials. A full-featured serials control system would consolidate the information in these files, do much to reduce the duplication of work by numerous staff and improve the accuracy of the Library's records. Such a system would also allow the Library to replace the serials list -- an extremely valuable tool but with incomplete bibliographic information unique to the Library and preventing any attempt for cooperative union lists or future systems.

We leave the specific task of selection and evaluation of a serials control system for the Committee we recommend be established (see Recommendation nine). However, we urge that the general criteria given at the end of chapter three be followed and, in particular, that the system have the following basic characteristics:

-- Provide all important serials functions including automatic claiming, holdings information, binding information, check-in, accounting features and associated management reports.

-- Include all Library serial titles, current and retrospective.

-- That the system's records be MARC based.

-- Provide online accessibility by patrons and staff.

Finally, if the system selected for serials control is part of a larger integrated system, there is an ideal opportunity for the Library to fully evaluate and have experience with two integrated systems, the present CLSI system and the system providing serials control. The time frame during which these two systems

would be in use would also provide an important period for integrated systems, still relatively new in library automation, to mature and develop.

3. The Committee recommends that: the Library have an online catalog in place by academic year 1989/90. We recommend further that this catalog be the basis of a single, full-function, integrated online system to replace all other systems in the Library, other than OCLC, and that these systems be replaced by academic year 1990/91.

After serials control, the area with the greatest potential impact on patrons is an online catalog. Of necessity, this recommendation takes place in five years to allow time for the serials system and the online catalog to develop. Because of this relatively long-term time frame, we do not feel we can make specific recommendations regarding timing or implementation. However, we do believe it is critical that the Library make a conscious decision to stand with a single integrated system and take specific steps to implement it.

4. The Committee recommends that: CLSI be given no special consideration due to its current status and investment by the Library. We recommend continued use of CLSI for circulation functions for the immediate future but that the Library make no additional investments of any sort in CLSI other than those required to maintain the present circulation functions.

Our analysis shows there have been numerous problems and difficulties with CLSI. If CLSI is not the best system for the Library the Library should not feel it is shackled to it simply because it has been in use for the last seven years. If the

Library determines there is a system that will offer enhanced performance and lower costs than CLSI then the Library should abandon CLSI and pursue the system that will serve it better.

It is our position that whatever investments have been made in CLSI by the Library are not lost. As a circulation system CLSI has served the Library for over seven years. In contrast, for-profit corporations buy computer systems with the full intention of replacement in three years. A recent survey by Datapro (Henkel, 1985) found that the average age of mainframe computers in the United States was an astounding 10 months Of course, no small part of the motivation for this turnover is the tax advantages not available to the University. Nonetheless, this rate of change allows corporations to improve their performance and cost-effectiveness. The Library should also have this opportunity.

5. The Committee recommends that: the machine readable tapes produced from the Library's participation in OCLC be viewed as the primary bibliographic record and file of the Library's holdings until the implementation of a single integrated system in the Library.

The field of library automation is a volatile one and there is little indeed that can be safely described as firm and long lasting in such a vastly changing market place, with the major exception of OCLC. Until the Library makes a definitive decision on a single integrated system, it should protect the investment in its OCLC tapes. OCLC is so pervasive that the tapes are a near standard and the Library can be assured that, regardless of its final decision in five or six years, the system will make

provision for OCLC records. Protection of these tapes as the primary record of the Library's holdings will ensure the greatest flexibility and choice.

6. The Committee recommends that: the Library initiate a retrospective conversion project as soon as possible with completion prior to 1990/91, the year of implementation for the online catalog.

The Committee was not able to focus a great deal of analysis on the need to convert the Library's records to machine-readable form. However, the issue is an important one; its importance is increased given the above recommendations for implementation of an online catalog. Without a conversion project an online catalog would be limited to the Library's holdings after 1972, the year the Library began its participation in OCLC.

A Library Technical Services Committee addressed the retrospective conversion issue in February, 1984 and recommended the allocation of $313,000 for a conversion project. However, there have been some very recent major improvements and options for conversion. Our Committee believes the Library could now convert its holdings for a total of $180,00, nearly half the 1984 estimate. The savings result primarily from decreased charges for converted records from approximately $1.00 per record in 1980 to 40 cents per record in 1985. At 40 cents, the cost is not likely to decrease much further.

7. The Committee recommends that: the Library give careful and deliberate consideration to network arrangements in automation.

There are excellent reasons for the Library to join and promote network arrangements (financial savings, general resource and information sharing, etc.). As the library for the state's university the Library has special motivation for participating in such cooperative ventures. However the HELIN arrangement has also shown that there are prices to pay when systems are shared by libraries whose practices and needs may be very different. We recommend neither complete abandonment of network arrangements nor their unequivocal espousal; we simply recommend that the pros and cons of such arrangements be fully considered, that the disadvantages be fully known and that the advantages, whatever they may be, are considered to outweigh the disadvantages.

8. The Committee recommends that: the Library and University administration make appropriations of $700,000 as follows:

-- For the serials control system, $120,000 by 1987/88.

-- For the online catalog, $400,000 by 1989/90.

-- For a retrospective conversion project, $180,000 by 1989/90.

As discussed in the section on fiscal operations in chapter one, there are several methods to obtain funding for the kind of project we propose. We believe the Library and University administration are in the best position to decide which particular route is most promising and workable. However, we firmly believe that the bulk of the funds necessary for this project should not come out of the standard book budget and that funds be allocated to the Library in some form of special allocation.

For serials control and the online catalog the allocation of funds may come in the year specified. However, a retrospective conversion project must occur over time and funds should be allocated over a period of two or three years with final completion by 1989/90 and the implementation of the online catalog. Of the costs for these projects, conversion is the only one that involves resources for staff costs. It is anticipated that staff added as part of the project would be temporary and last until project completion. The allocation for retrospective conversion anticipates the use of four FTE's. We recommend that these four be distributed over two years with one full-time librarian and one full-time library technician.

It must be emphasized that all the above figures are approximate. It is not possible to give accurate estimates when (1) the specific systems are not chosen and (2) will not be chosen for at least two years from now when prices and market conditions can be dramatically different.

9. We recommend that the Dean of the Library establish a committee as soon as possible to select and oversee the implementation of the serials control system and that once the system is implemented a second committee be established to implement the online catalog. We further recommend that these committees make reports to the faculty and staff on their progress at least quarterly.

The Committees we recommend here have two primary functions. First, to address and resolve all the associated issues of implementation with the serials control System and the online catalog.

There are many such issues. Among the most important are selection, impact on staffing, start-up needs, and conversion of Library records to machine readable form.

The second responsibility of the two committees is follow-up and communication. These committees should work with Library and University administration to see that the above recommendations are implemented. We also believe it is important for these committees to make frequent reports to the faculty and staff of the Library, in whatever format they desire, on their progress.

In conclusion, the Committee believes this is a most opportune time for the Library and the University. The technological, economic and professional trends and forces discussed in this report are coming together to forge and environment that is ideal for a library the size and character of URI's to move ahead in automation.

There are many methods other than computerization to address the issues identified in this report. The Committee recommends automation not because it is a trendy and sophisticated approach but because we believe it will offer the greatest benefit to both patrons and staff at the Library and because it is a forward-looking solution that holds the promise of increased performance and decreasing costs in the future.

5. Appendix

5.1. The University of Rhode Island

The University was chartered as the state agricultural school in 1888. The school became the Rhode Island College of Agriculture and Mechanic Arts in 1892, and the first class of 17 members graduated two years later. After another name change to Rhode Island State College in 1909, the college became the University of Rhode Island in 1951.

In addition to the main campus in Kingston the University has three other campuses. The College of Continuing Education has a building in downtown Providence. It offers a wide variety of classes for the adult learner as well as business-related courses in an urban setting. The W. Alton Jones Campus in the western section of the state is a rural area used for environmental education, research, and conference facilities. The Narragansett Bay Campus, six miles east of the main campus, is the site of the Graduate School of Oceanography. Its unique location near the ocean and Narragansett Bay, has facilitated the development of strong marine programs and the designation as one of the national Sea Grant colleges.

Trends in enrollment at URI tend to parallel enrollment trends nationally. Total URI enrollment grew steadily to a peak of 14,876 students in 1981/82 and has declined slightly to 13,685 in 1984/85. Graduate student enrollment peaked in 1982/83 and declined in 1984/85 to 2,874. (See Figure 5-1.) Enrollment of undergraduates by college has fluctuated over the last five years, with enrollment declining in Liberal Arts and Resource Economics, but growing in Business Administration, Engineering, and Nursing. (See figure 5-2.) The number of faculty positions funded by the state has changed less over the past five years, varying from a high of 709 in 1981/82 to a low of 696 in 1984/85. (See Table 5-1.)

College	1980	1981	1982	1983	1984
Arts Sciences	325.1	311.6	322.6	323.6	324.4
Business Administration	58.5	59.5	60.5	62.5	60.9
Engineering	73.0	73.0	75.0	75.0	75.5
Graduate School	37.5	37.5	37.5	37.5	37.5
Human Science & Services	71.3	71.8	73.8	73.8	69.3
Nursing	33.5	33.5	33.5	33.5	29.5
Pharmacy	31.5	31.5	31.5	31.5	31.5
Resource Development	75.8	75.8	74.9	68.2	68.2
Totals	706.2	704.2	709.4	705.6	696.7

Table 5-1: Faculty State-Funded Positions

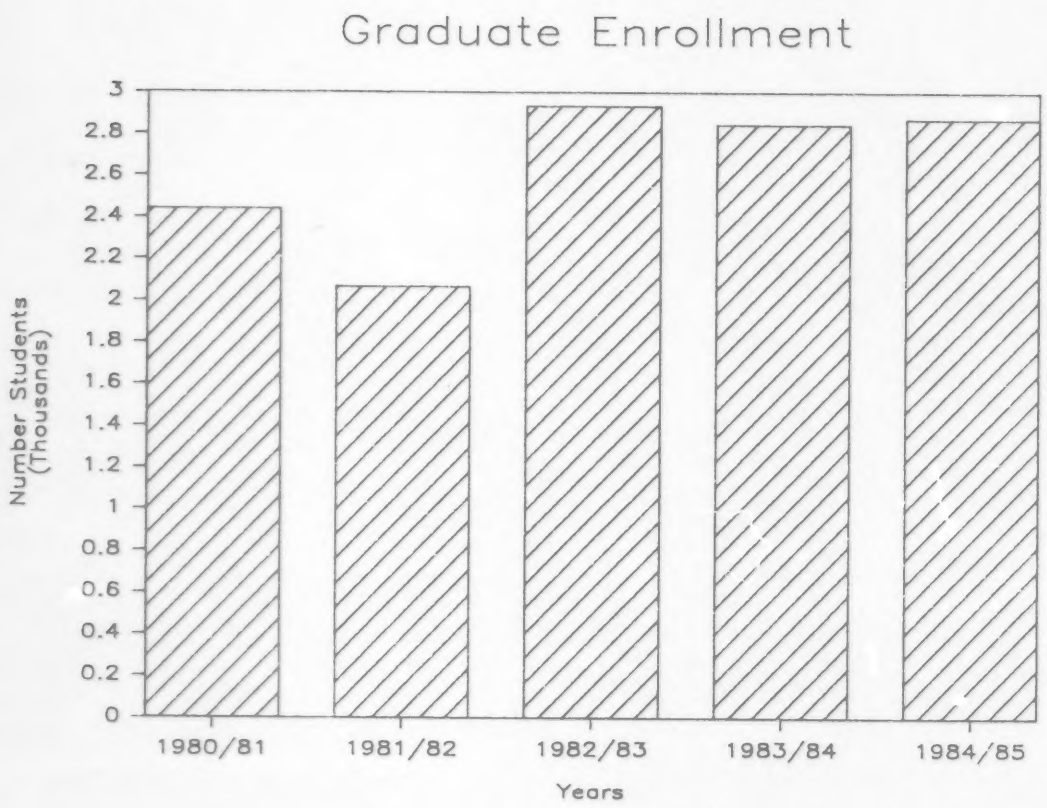

Fig. 5-1: Graduate Enrollment

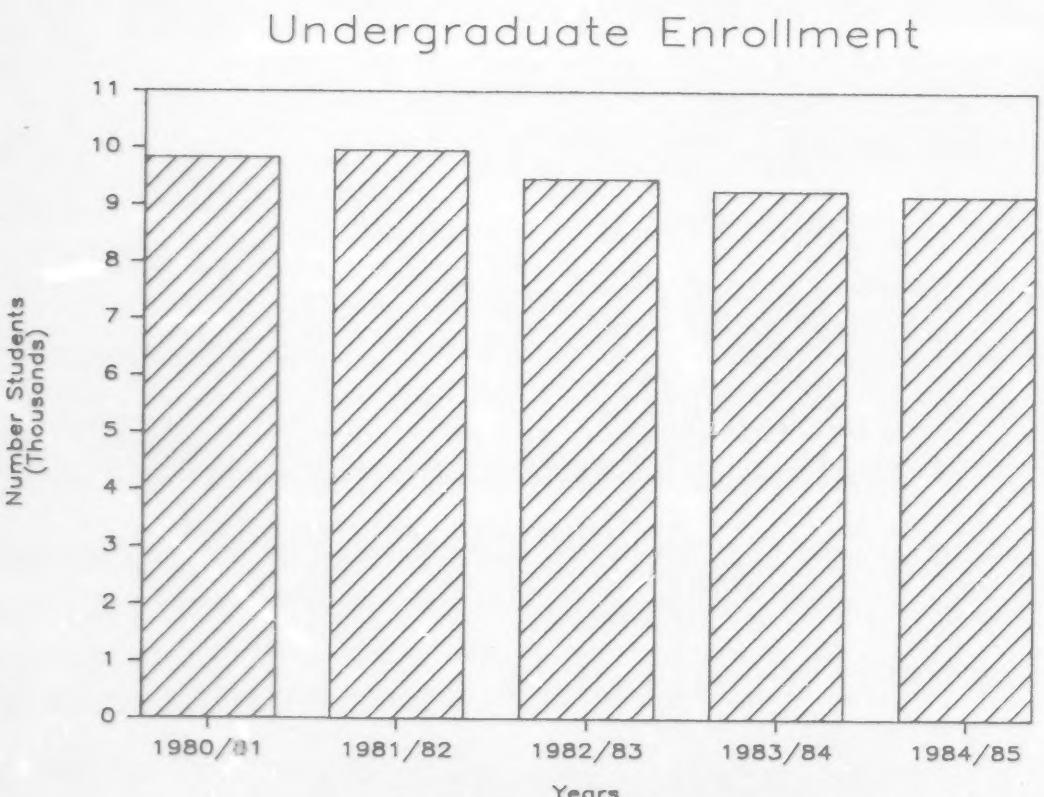

Fig. 5-2: Undergraduate Enrollment

5.2. Explanation of Symbols for Graphic Analysis

The charts used in Chapter Three focus on the flow of information through the Library. The graphic method used employs just three symbols: a rounded rectangle, a heavy sided square and a flat, open-ended rectangle.

The rounded rectangle represents steps or processes: Check Shelf for Volume, Search Author/Title Catalog, etc. These are activities or processes the patron or library staff member performs.

The flat, open-ended rectangle represents files. Files are simply places where information is stored. Files may be in numerous formats. Some are locally maintained card files (On Order File), standard published works (Books in Print) or even computer databases (OCLC). What is common to these is that they are all places where information is stored and maintained.

The last symbol, the heavy sided square, represents areas outside the scope of the particular chart. These symbols may be thought of as "black boxes;" something goes in or comes out, but how this is accomplished is not a concern. A good example is in the third chart, New Book Request. Processes twelve and thirteen send new books to the Cataloging Department, represented as a "black box," and out of Cataloging comes Cataloged Books. The cataloging of a book is a complex and important step for all Library materials. However, the chart focuses on a book order and from this perspective, the details of the cataloging process are not a concern. Conversely, were the cataloging process the subject of a chart, the Library's Acquisitions Department would likely be represented as a black box, sending new books into the process for cataloging.

In some cases, symbols appear more than once (see, for example, the second chart, Patron Search for a Serial, where interlibrary loan appears five times). This is perfectly acceptable and is done to make the charts less complex in appearance with a minimum of crisscrossing lines. The arrows connecting the symbols represent the flow of information or material from each step to the other. The numbering of the processes is done generally from left to right along the most common paths and the squares are lettered. The numbers and letters are not especially important, however, as they serve primarily for identification.

A complete explanation of these symbols and their uses may be found in the book Structured Systems Analysis by Chris Gane and Trish Sarson (Prentice-Hall), 1979.

5.3. Glossary

AACR2 -- Anglo-American Cataloging Rules, Second Edition. The official rules by which bibliographic materials are cataloged. The second edition took effect in 1981.

Authority Control -- The rules and procedures by which an authoritative, official form of a name or term, such as a subject heading, is applied and maintained uniformly in a bibliographic file.

Authority File -- A file containing the accepted forms of headings (or access points) for a set of bibliographic records. May include cross references and links between broader, narrower or related terms.

Barcode (Label) -- A label containing numeric or alphanumeric data encoded into a series of vertical lines that can be read by machine. The UPC symbols on food items are barcode labels.

Bibliographic Database -- A file of records containing descriptive information (such as author, title, publisher, date) about a collection of documents in machine-readable form.

Bibliographic Control -- The process of recording the existence and identity of documents, providing access to them, and locating copies of them.

Bibliographic Record -- A grouping of bibliographic data fields (such as author, title, publisher, date) treated as one logical entity that describes a specific bibliographic item.

Bibliographic Utility -- An organization that provides online access to bibliographic databases, usually for cataloging and cataloging-related purposes. The primary utilities are OCLC, RLIN, WLN and UTLAS.

Boolean Operators -- The logical operators AND, OR, and NOT. In an online query of a bibliographic database they are used to separate and define the contents of a query. For example, a query for books on the use of the computer in libraries might be entered as: (Computers OR Automation) AND Libraries.

CLSI -- CL Systems Inc. A vendor of library turnkey systems. See section 2.3 of this report for a complete analysis of CLSI at the URI Library.

COM -- Computer Output Microform. A method that transfers machine-readable data to microform (film or fiche) to replace traditional printed output from the computer.

CRT -- Cathode Ray Tube. The television-like display of a computer terminal.

Download -- To take data from a large, often remote computer and save it for use and manipulation on a smaller computer.

Dumb Terminal -- A computer terminal that is limited to displaying data sent to it and/or transmitting data entered on it; data cannot be stored or processed.

Hit -- A record retrieved as the result of a query of an online bibliographic system.

Integrated System -- A system that uses common files and data structures to perform several different operations.

MARC Record -- Machine Readable Cataloging Record. A standard and accepted set of rules regarding the format and structure of bibliographic items in machine-readable form. Designed by the Library of Congress.

NELINET -- New England Library Information Network. Primary purpose is to serve as a broker for the bibliographic services of OCLC. As of 1985 membership includes 324 institutions with a total of 875 libraries in New England. The URI Library is a member of NELINET.

Network -- A system of physically separate computers with telecommunication links allowing the resources of each participating machine to be shared by each of the others.

OCLC -- Online Computer Library Center (formerly Ohio College Library Center). A bibliographic utility that provides access to a large database of bibliographic records to libraries throughout the United States and internationally. For a more complete discussion, see section 2.2 of this report.

OPAC -- Online Public Access Catalog. A computer system that replaces the traditional library card catalog with terminals for online access.

RLIN -- Research Libraries Information Network. A bibliographic utility owned and operated by the Research Libraries Group. Emphasis of RLIN is the needs of large, research libraries.

Response Time -- The time taken for an online computer system to respond to a user's request or command.

Retrospective Conversion -- The process by which a library changes the record of its holdings from printed form (typically catalog cards) to machine-readable form.

Turnkey System -- A complete computer system provided by a vendor. The vendor supplies all elements including hardware, software, installation, training, maintenance, etc.

UTLAS -- University of Toronto Library Automation System. A bibliographic utility, much like OCLC, that serves Canada.

VDT -- Video Display Terminal. See the definition for CRT.

WLN -- Washington Library Network. A bibliographic utility, much like OCLC, that serves the Northwestern United States.

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